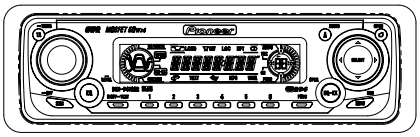
Pioneer sound.vision.soul

Service Manual



DEH-P4500R/XM/EW

ORDER NO.
CRT2985

MULTI-CD CONTROL HIGH POWER CD PLAYER WITH RDS TUNER

DEH-P4500R XM/EW, XN/EW

COMPACT disc DIGITAL AUDIO

● This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech. Module	Remarks
CX-3026	CRT2944	S10	CD Mech. Module:Circuit Description, Mech.Description, Disassembly

For details, refer to "Important symbols for good services".

PIONEER CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O.Box 1760, Long Beach, CA 90801-1760 U.S.A.
PIONEER EUROPE NV Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE.LTD. 253 Alexandra Road, #04-01, Singapore 159936

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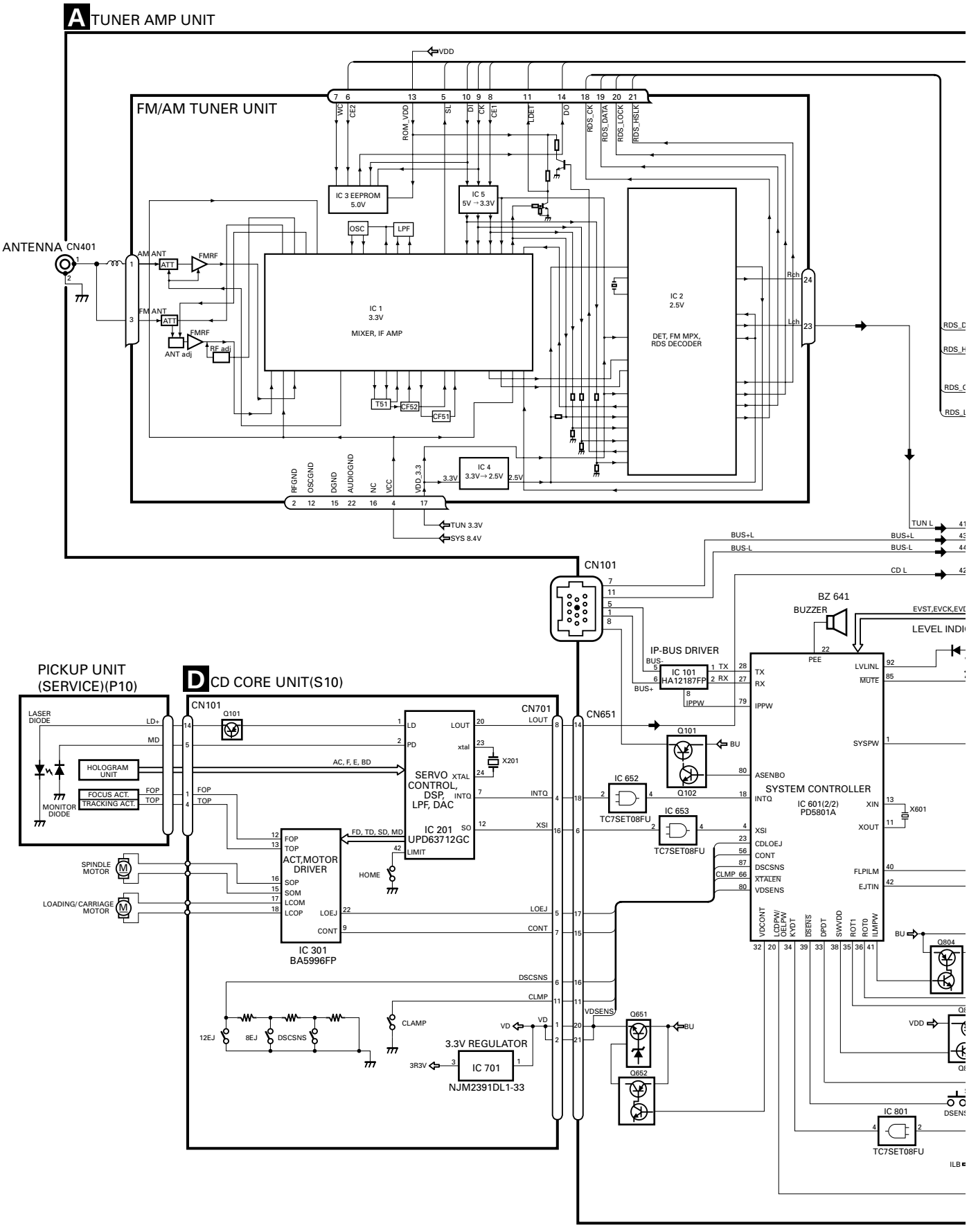
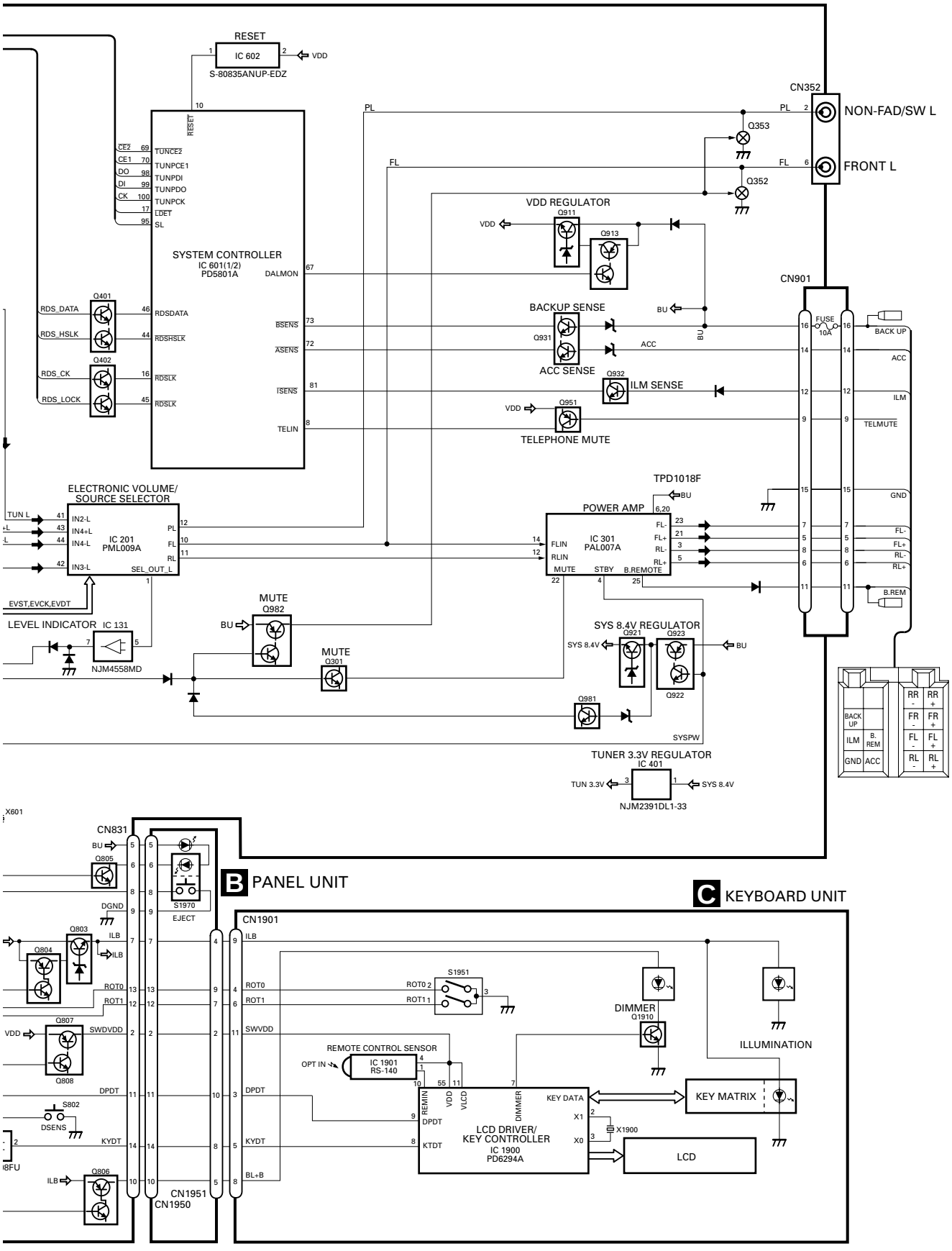
K-ZZA. NOV. 2002 Printed in Japan

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

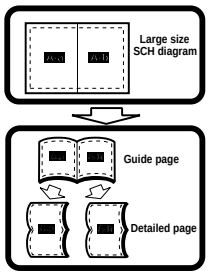
3.1 BLOCK DIAGRAM

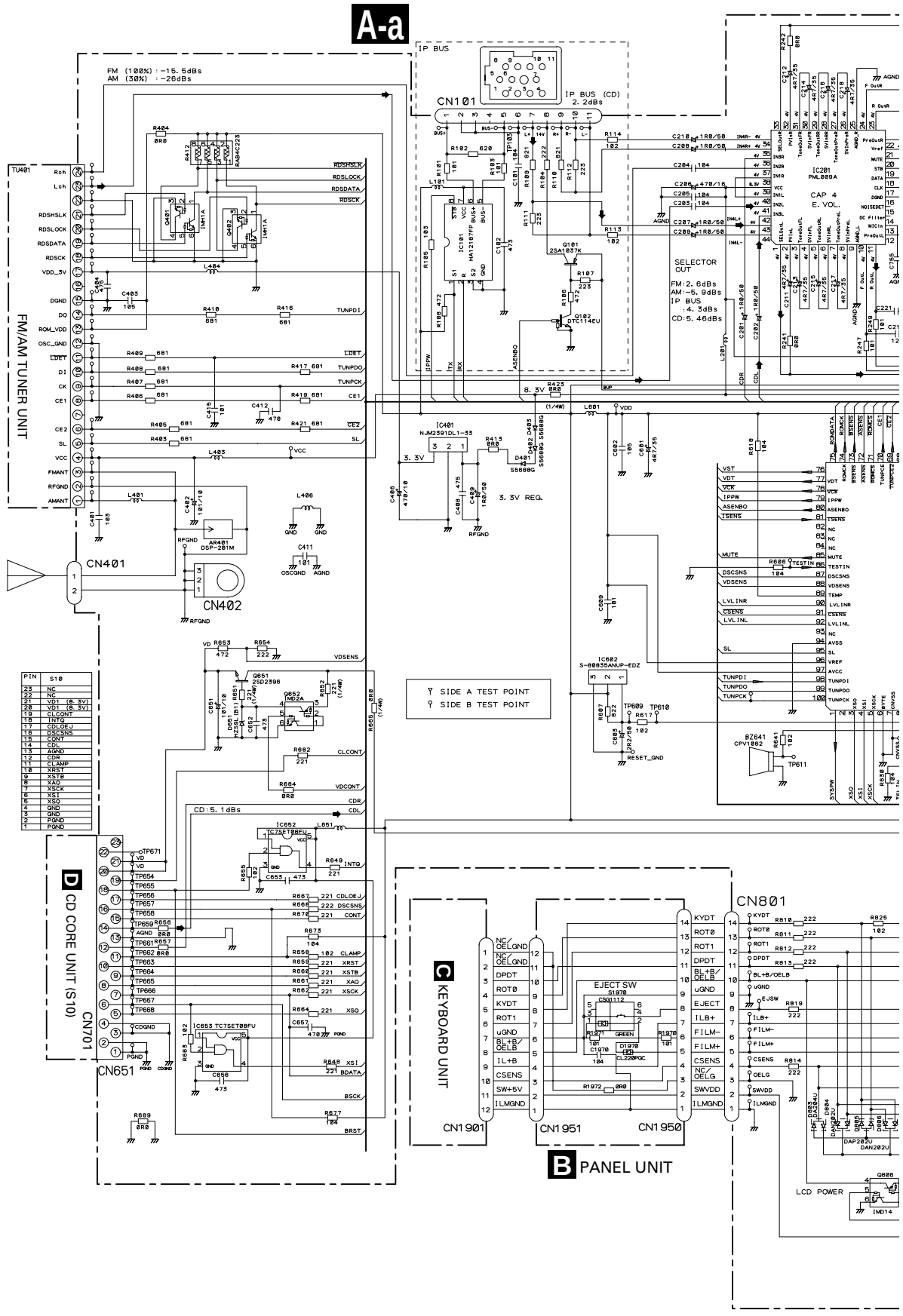


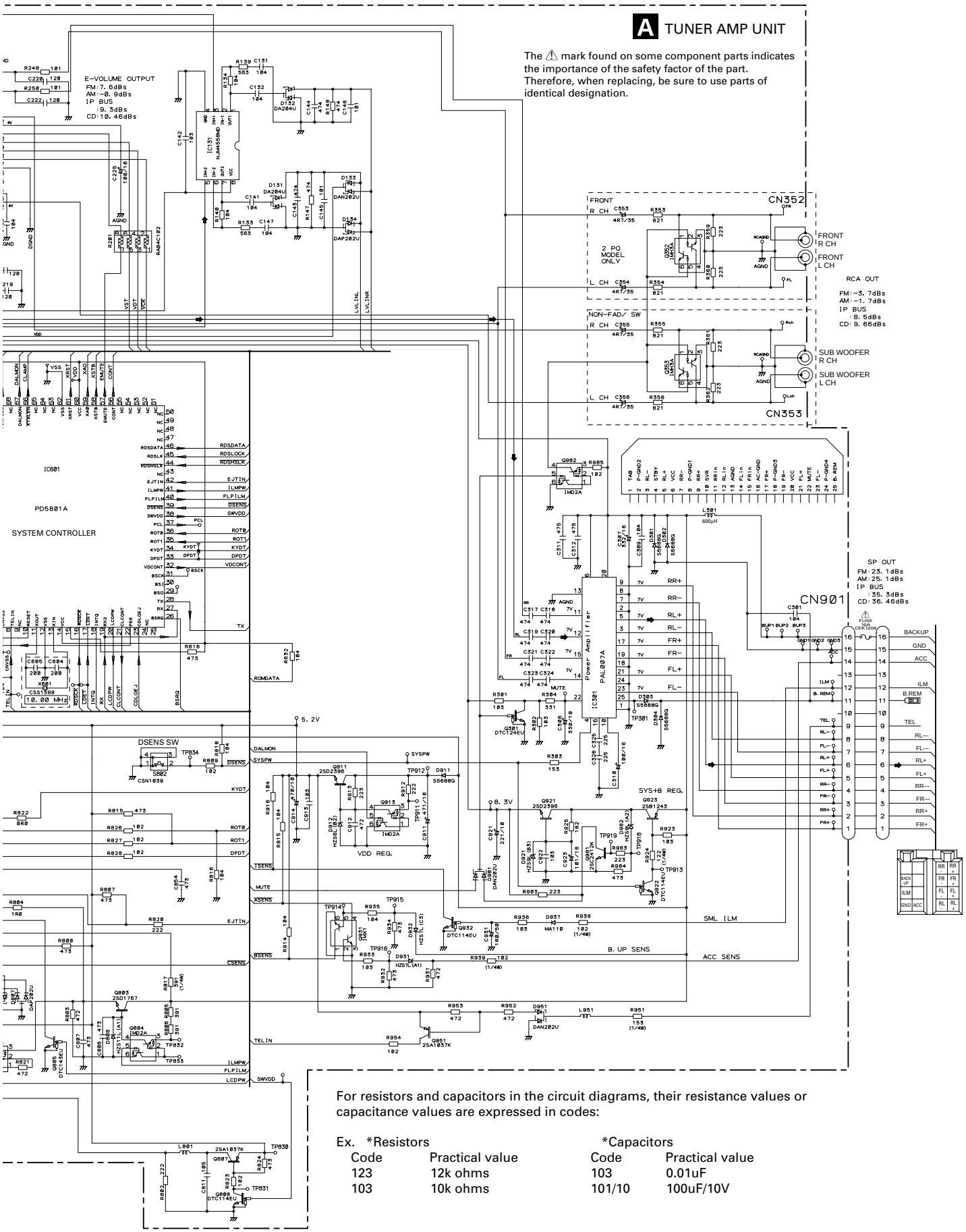

RESET
IC 602
S-80835ANUP-EDZ
VDD
SYSTEM CONTROLLER
IC 601(1/2)
PD5801A
RESET
TUNCE2
TUNPCE1
TUNPDI
TUNPDO
TUNPCK
LDET
SL
DALMON
BSENS
ASENS
ISENS
TELIN
RDSDATA
RDSHSLK
RDSLK
RDSLK
RDS_DATA
RDS_HSLK
RDS_CK
RDS_LOCK
Q401
Q402
CN352
NON-FAD/SW L
FRONT L
Q353
Q352
PL
FL
VDD REGULATOR
Q911
Q913
BACKUP SENSE
Q931
ACC SENSE
Q932
ILM SENSE
Q951
TELEPHONE MUTE
CN901
FUSE 10A
BACK UP
ACC
ILM
TELMUTE
GND
FL-
FL+
RL-
RL+
B.REM
ELECTRONIC VOLUME/
SOURCE SELECTOR
IC 201
PML009A
IN2-L
IN4+L
IN4-L
IN3-L
SEL_OUT_L
TUN L
EVST,EVCK,EVDT
LEVEL INDICATOR
IC 131
NJM4558MD
MUTE
Q982
Q301
TPD1018F
POWER AMP
IC 301
PAL007A
FLIN
RLIN
MUTE
STBY
B.REMOTE
SYS 8.4V REGULATOR
Q921
Q923
Q922
Q981
SYSPW
TUNER 3.3V REGULATOR
IC 401
TUN 3.3V
SYS 8.4V
NJM2391DL1-33
X601
CN831
Q805
S1970
EJECT
DGND
Q803
Q804
Q807
Q808
S802
DSENS
Q806
ILB
ROT0
ROT1
SWVDVD
DPDT
KYDT
BL+B
CN1951
CN1950
B PANEL UNIT
C KEYBOARD UNIT
CN1901
S1951
DIMMER
Q1910
ILLUMINATION
REMOTE CONTROL SENSOR
IC 1901
RS-140
OPT IN
LCD DRIVER/
KEY CONTROLLER
IC 1900
PD6294A
REMIN
VDD
VLCD
DIMMER
KEY DATA
DPDT
KTDT
X1
X0
X1900
KEY MATRIX
LCD
BACK UP
ILM
B. REM
GND
ACC
RR
FR
FL
RL

3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

Note: When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".

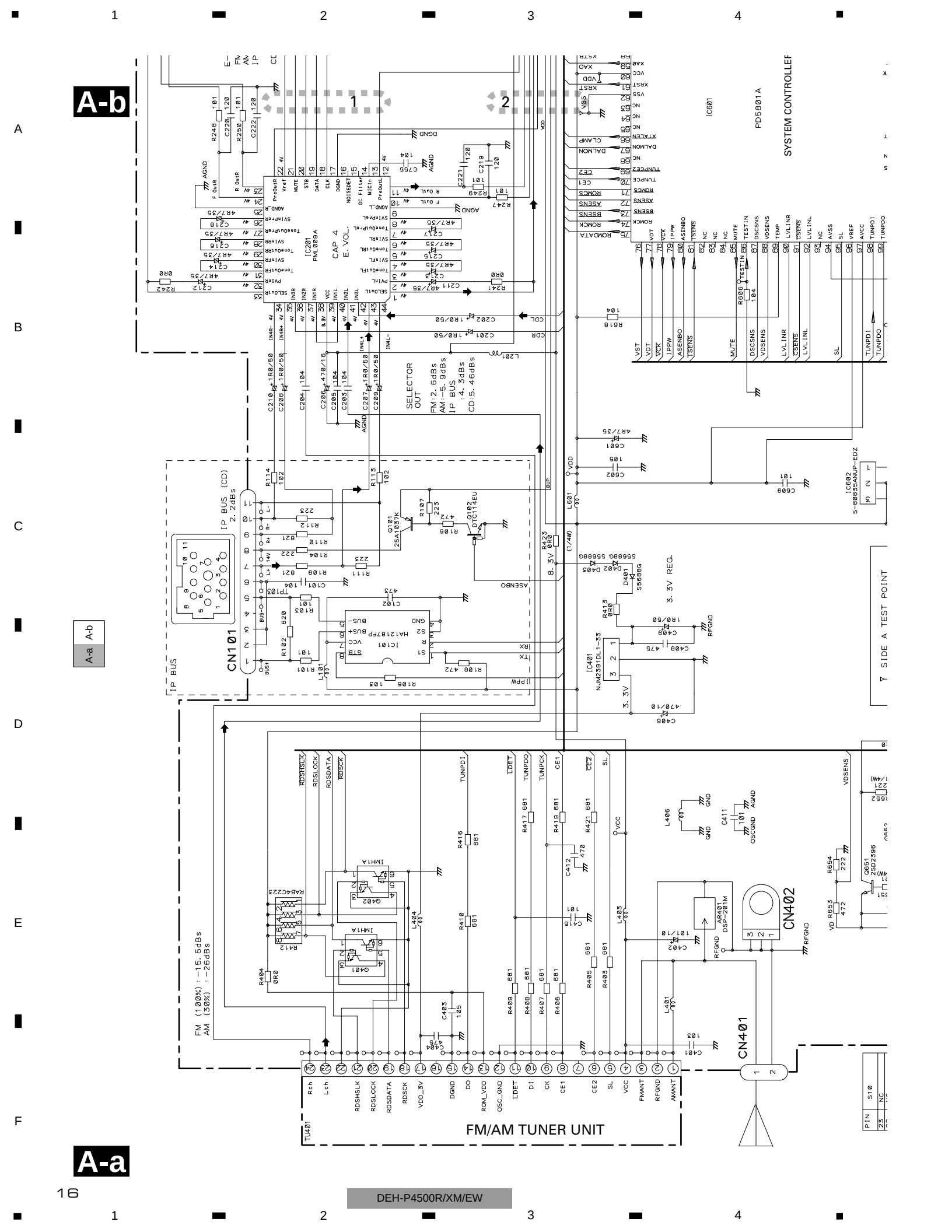


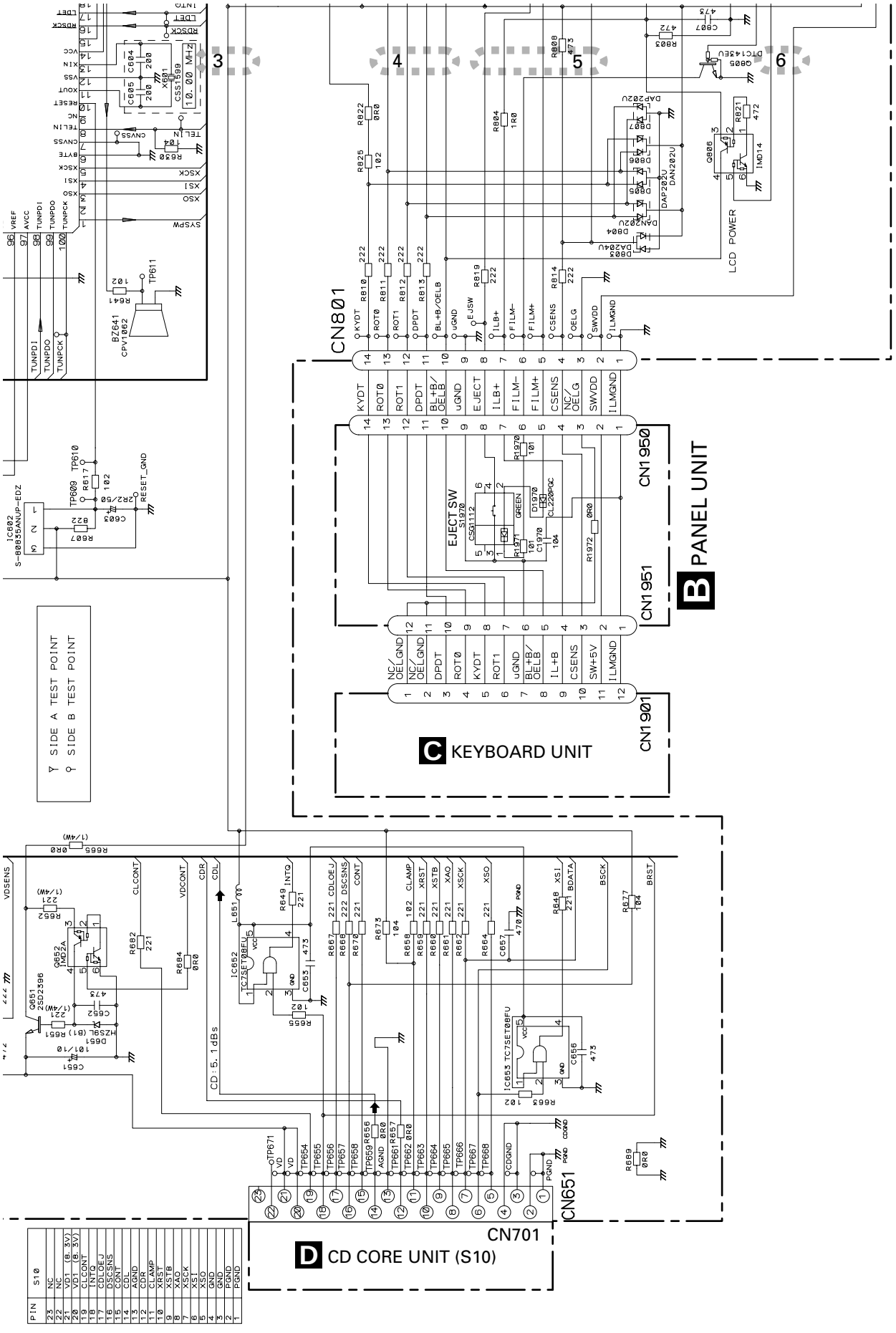




For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

Ex.	*Resistors		*Capacitors	
	Code	Practical value	Code	Practical value
	123	12k ohms	103	0.01uF
	103	10k ohms	101/10	100uF/10V


A-b
A-a
SYSTEM CONTROLLER
IC601
PD5801A
IC201
PML809A
CAP 4
E. VOL.
SELECTOR
OUT
FM:2.6dBs
AM:-5.9dBs
IP BUS :4.3dBs
CD:5.46dBs
IP BUS (CD)
2.2dBs
CN101
IP BUS
IC101
HA12187FP
IC401
NJM2591DL1-33
3.3V REG.
8.3V
SIDE A TEST POINT
CN402
CN401
FM (100%) : -15.5dBs
AM (30%) : -26dBs
FM/AM TUNER UNIT
TU401
Rch
Lch
RDSHSLK
RDSLOCK
RDSDATA
RDSCK
VDD_5V
DGND
DO
ROM_VDD
OSC_GND
LDET
DI
CK
CE1
CE2
SL
VCC
FMANT
RFGND
AMANT

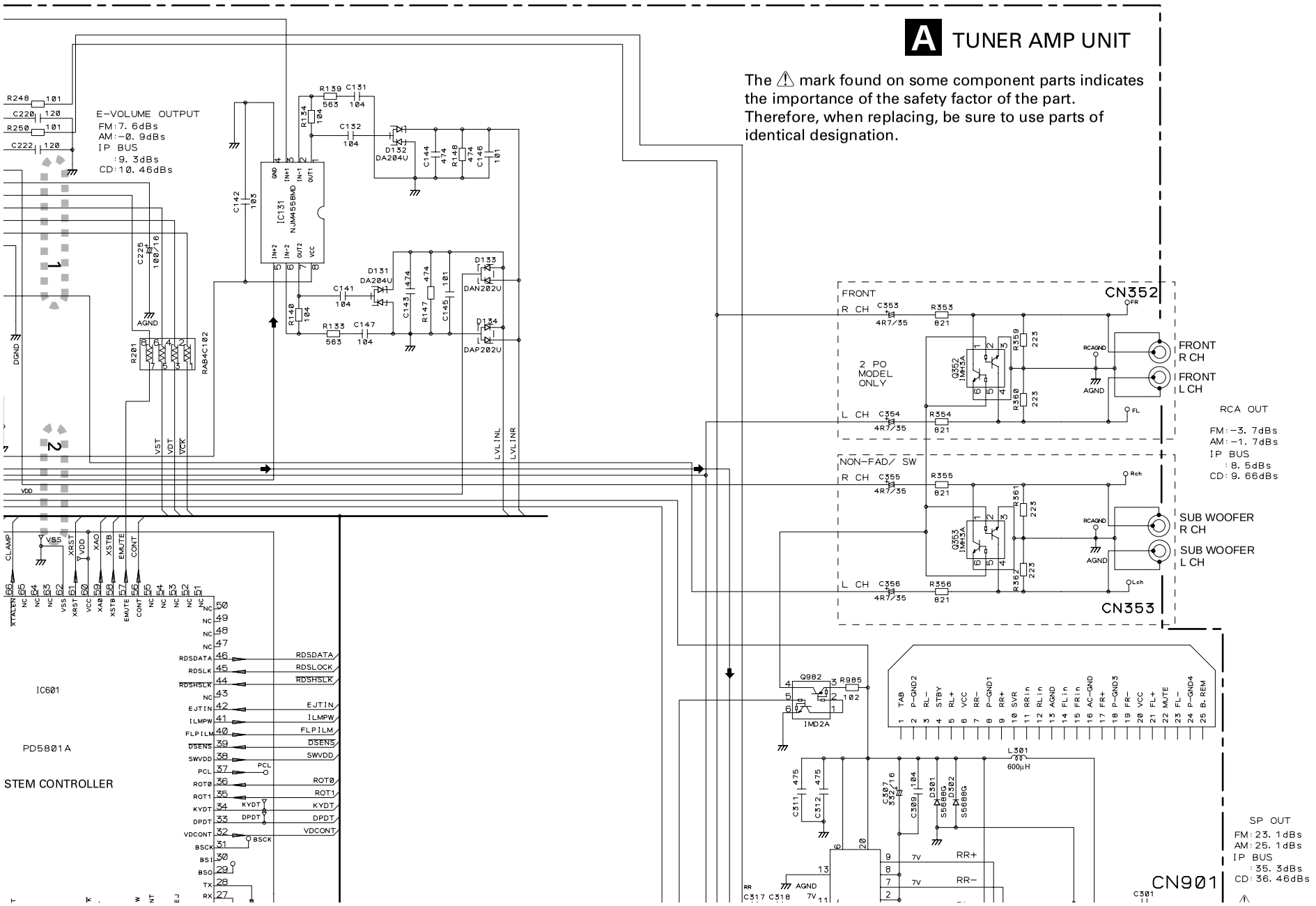

A-b
CN801
CN1950
CN1951
CN1901
B PANEL UNIT
C KEYBOARD UNIT
D CD CORE UNIT (S10)
CN651
CN701
EJECT SW
LCD POWER
SIDE A TEST POINT
SIDE B TEST POINT
CD : 5. 1dBs
A-a B

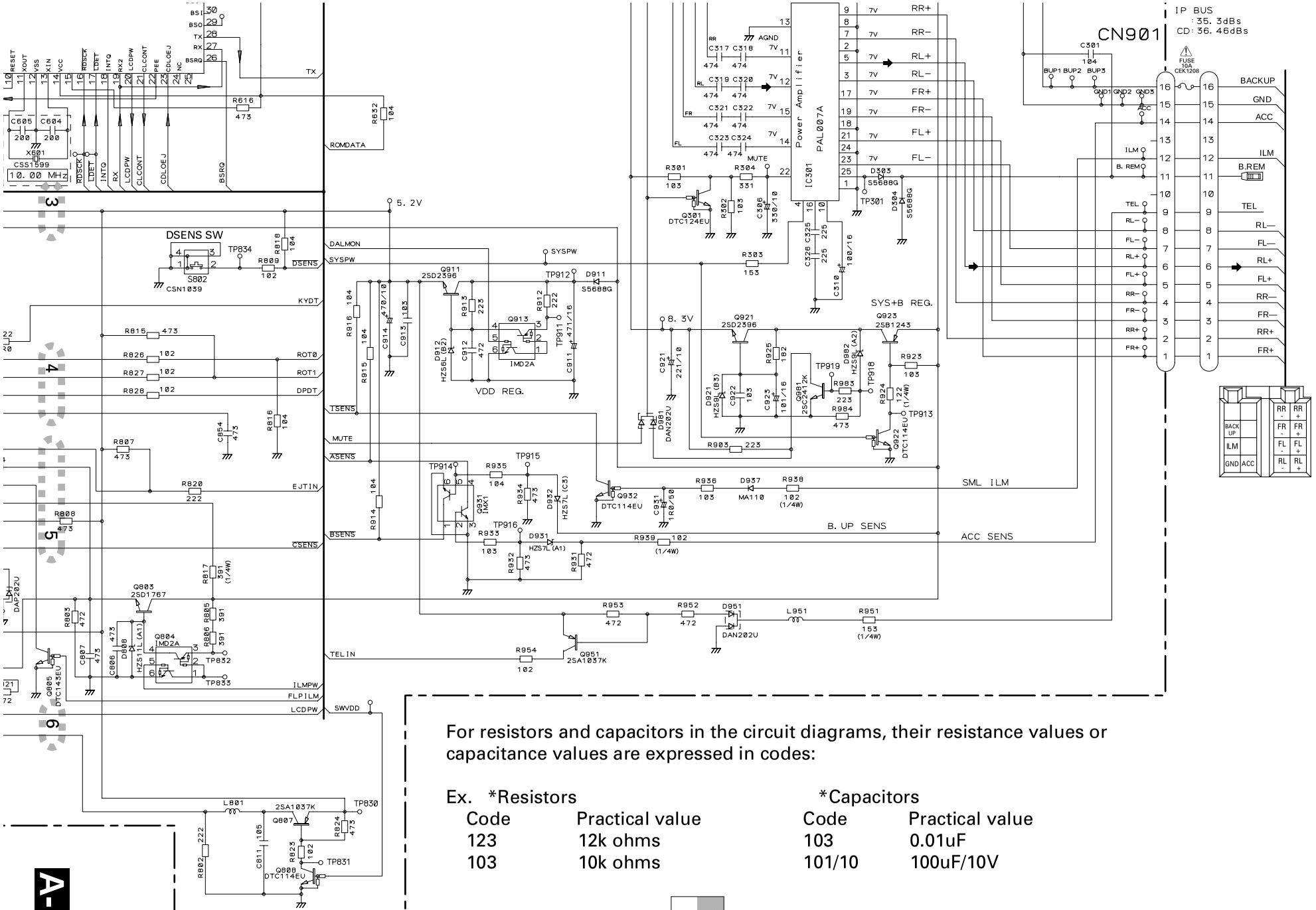
A-b

A-a | A-b

A TUNER AMP UNIT

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.





For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

Ex. *Resistors

Code	Practical value
123	12k ohms
103	10k ohms

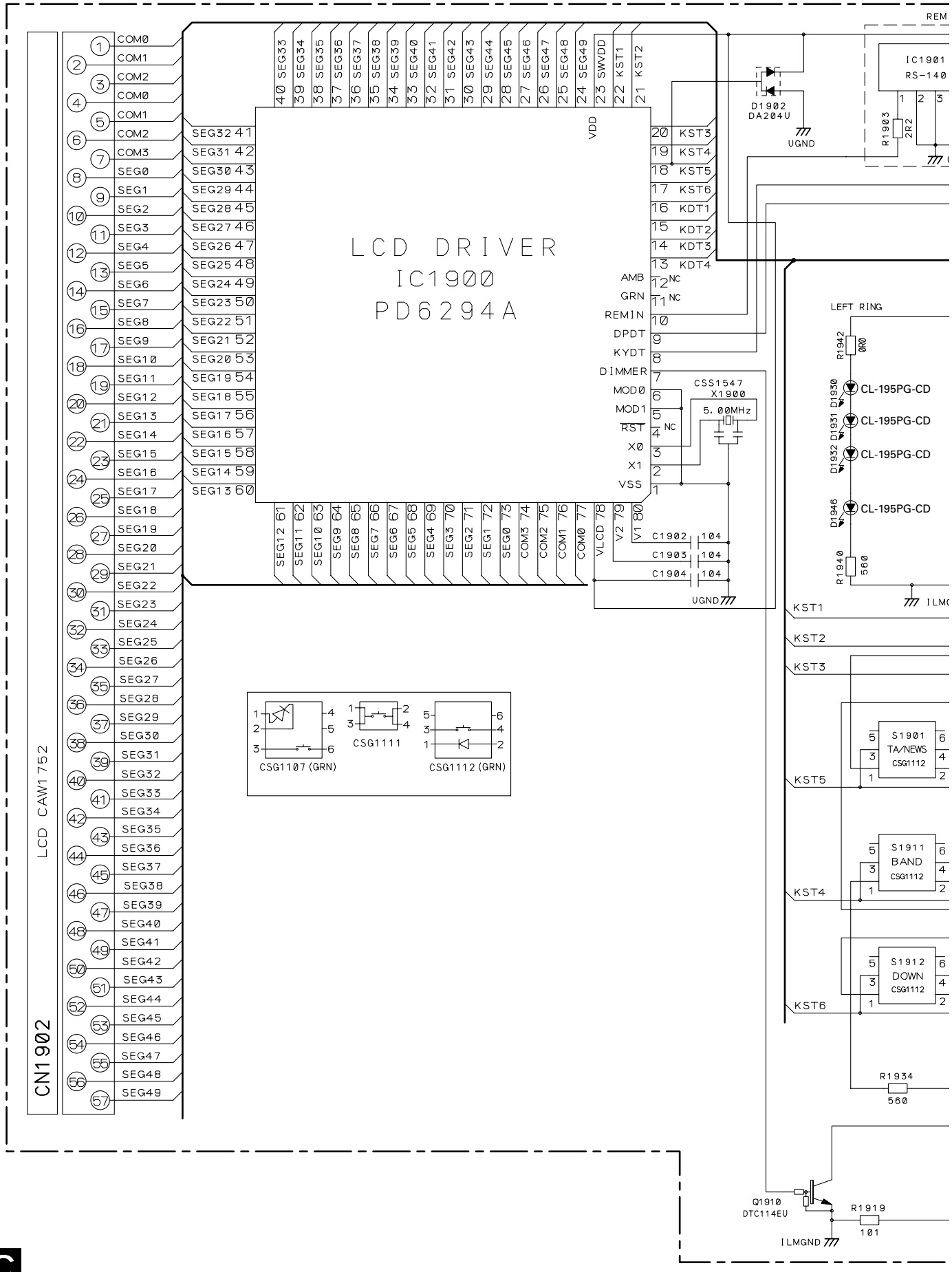
*Capacitors

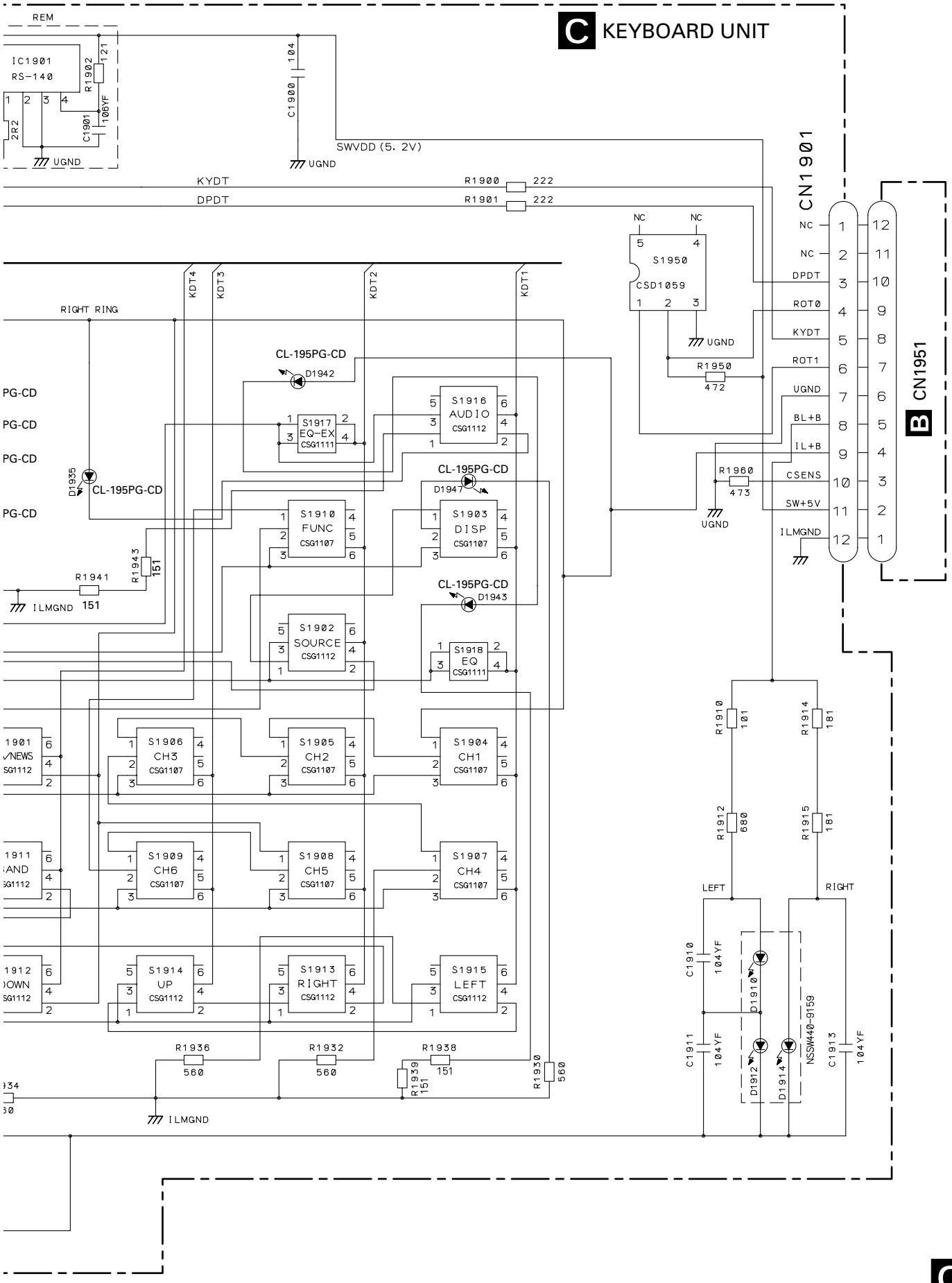
Code	Practical value
103	0.01uF
101/10	100uF/10V

A-a A-b

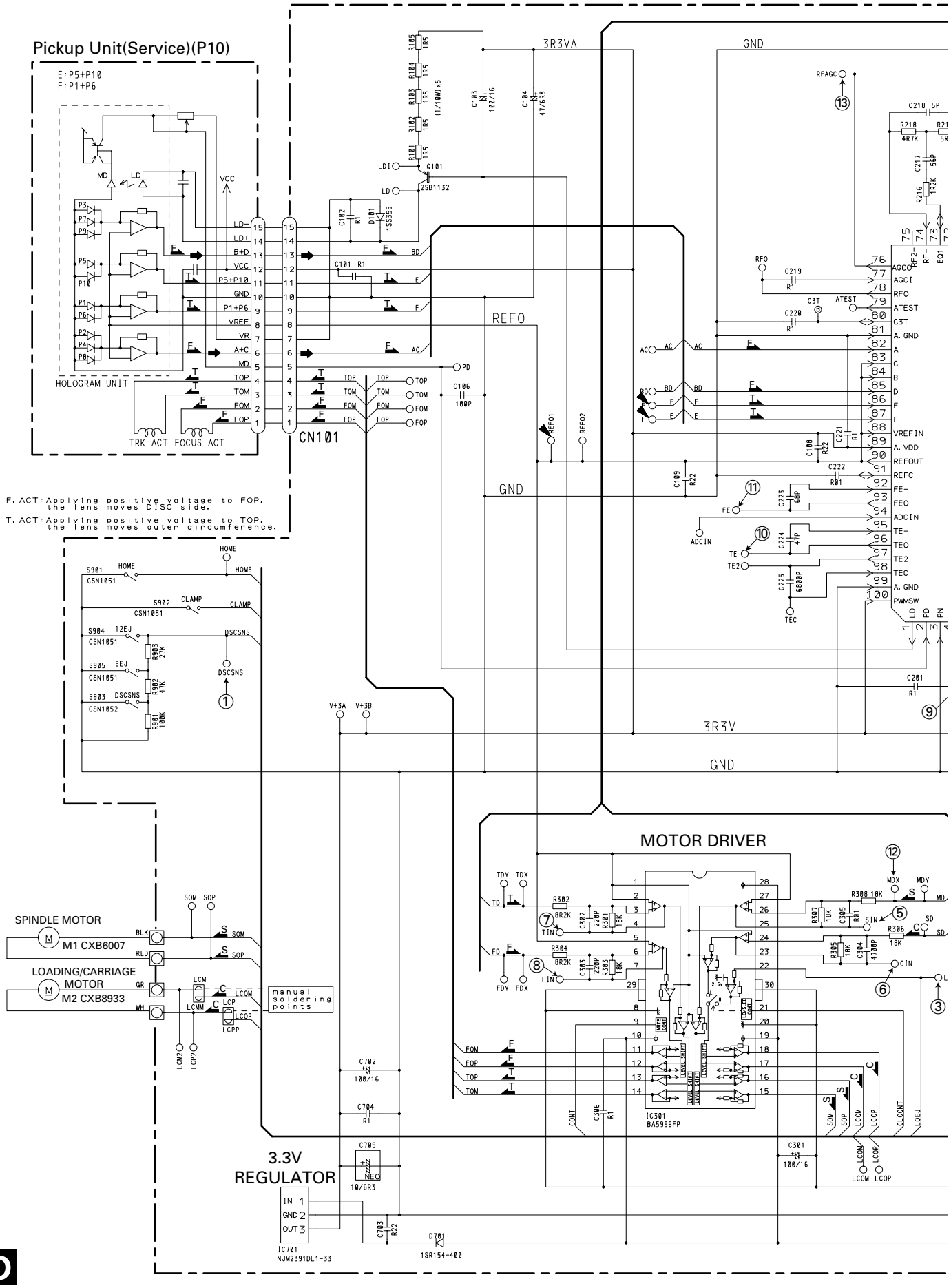
A-b

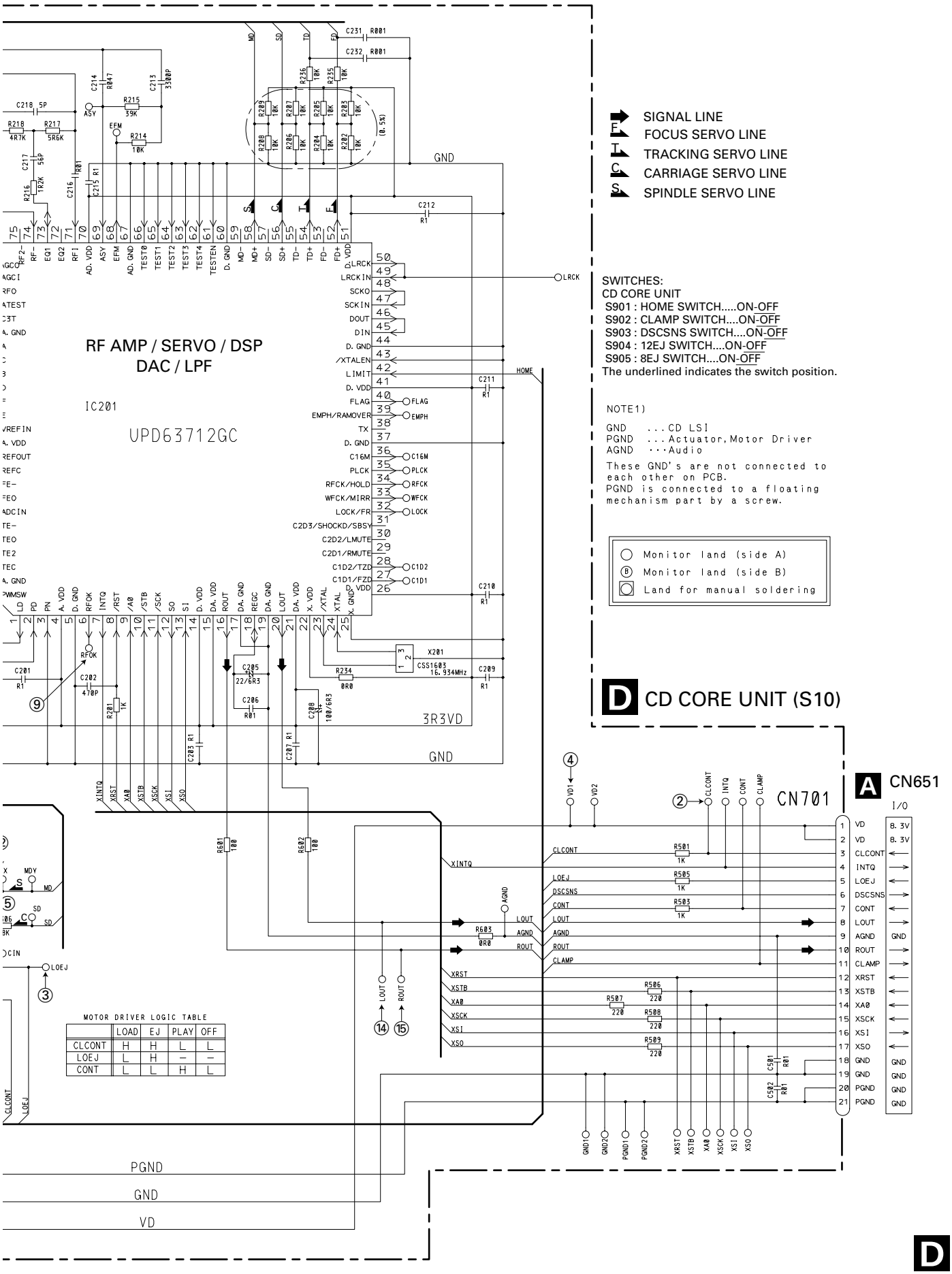
3.3 KEYBOARD UNIT




C KEYBOARD UNIT
REM
IC1901
RS-140
R1902
121
106YF
C1901
2R2
UGND
C1900
104
SWVDD (5. 2V)
KYDT
DPDT
R1900
222
R1901
222
CN1901
B CN1951
NC
NC
DPDT
ROT0
KYDT
ROT1
UGND
BL+B
IL+B
CSENS
SW+5V
ILMGND
S1950
CSD1059
R1950
472
R1960
473
KDT4
KDT3
KDT2
KDT1
RIGHT RING
PG-CD
CL-195PG-CD
D1942
D1935
D1947
D1943
S1916
AUDIO
CSG1112
S1917
EQ-EX
CSG1111
S1910
FUNC
CSG1107
S1903
DISP
CSG1107
S1902
SOURCE
CSG1112
S1918
EQ
CSG1111
R1941
151
R1943
151
ILMGND
S1906
CH3
CSG1107
S1905
CH2
CSG1107
S1904
CH1
CSG1107
S1909
CH6
CSG1107
S1908
CH5
CSG1107
S1907
CH4
CSG1107
S1914
UP
CSG1112
S1913
RIGHT
CSG1112
S1915
LEFT
CSG1112
R1936
560
R1932
560
R1938
151
R1939
151
R1930
560
R1910
101
R1914
181
R1912
680
R1915
181
LEFT
RIGHT
C1910
104YF
C1911
104YF
C1913
104YF
D1910
D1912
D1914
NSW440-9159

3.4 CD MECHANISM MODULE




SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE
SWITCHES:
CD CORE UNIT
S901 : HOME SWITCH.....ON-OFF
S902 : CLAMP SWITCH....ON-OFF
S903 : DSCSNS SWITCH....ON-OFF
S904 : 12EJ SWITCH....ON-OFF
S905 : 8EJ SWITCH....ON-OFF
The underlined indicates the switch position.
NOTE1)
GND ...CD LSI
PGND ...Actuator, Motor Driver
AGND ···Audio
These GND's are not connected to each other on PCB.
PGND is connected to a floating mechanism part by a screw.
Monitor land (side A)
Monitor land (side B)
Land for manual soldering
RF AMP / SERVO / DSP
DAC / LPF
IC201
UPD63712GC
D CD CORE UNIT (S10)
A CN651
I/O
CN701
MOTOR DRIVER LOGIC TABLE
LOAD EJ PLAY OFF
CLCONT H H L L
LOEJ L H – –
CONT L L H L
GND
PGND
VD
3R3VD

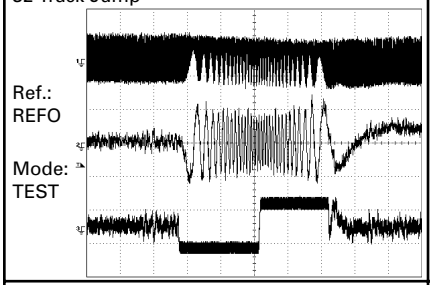
● Waveforms

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65V)

① DSCSNS 5V/div 500ms/div ② CLCONT 5V/div ③ LOEJ 5V/div ④ VD 10V/div When loading a 12cm CD Ref.: GND Mode: Normal	① DSCSNS 5V/div 500ms/div ② CLCONT 5V/div ③ LOEJ 5V/div ④ VD 10V/div When loading an 8cm CD Ref.: GND Mode: Normal	⑤ SIN 1V/div 2s/div ⑥ CIN 500mV/div ⑦ TIN 500mV/div When setting up after loading a 12cm CD-DA disc Ref.: REFO Mode: Normal
⑧ FIN 200mV/div 500ms/div ⑨ RFOK 2V/div ⑤ SIN 2V/div When setting up "Source On"(12cm CD-DA) Ref.: REFO Mode: Normal	⑩ TE 500mV/div 200ms/div ⑪ FE 500mV/div When setting up "Source On" Ref.: REFO Mode: Normal	⑪ FE 500mV/div 20ms/div ⑧ FIN 500mV/div ⑩ TE 500mV/div ⑦ TIN 500mV/div During "Play"(CD-DA) Ref.: REFO Mode: Normal
⑫ MDX 500mV/div 5ms/div ⑤ SIN 1V/div Spindle waveform during "Play" Ref.: REFO Mode: Normal	⑫ MDX 500mV/div 5µs/div ⑤ SIN 1V/div Spindle waveform during "Play"(Magnified) Ref.: REFO Mode: Normal	⑬ RFAGC 500mV/div 0.5µs/div RF eye pattern Ref.: REFO Mode: Normal
⑧ FIN 500mV/div 200ms/div ⑪ FE 500mV/div Focus Search Ref.: REFO Mode: TEST	⑩ TE 500mV/div 2ms/div ⑬ RFAGC 500mV/div When "Tracking Open" Ref.: REFO Mode: TEST	⑬ RFAGC 1V/div 500µs/div ⑩ TE 500mV/div ⑦ TIN 500mV/div 1 Track Jump Ref.: REFO Mode: TEST

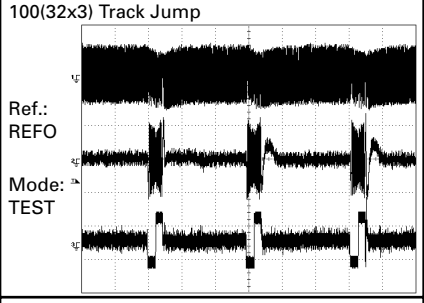
⑬ RFAGC	1V/div	500ms/div
⑩ TE	500mV/div	
⑦ TIN	500mV/div	

32 Track Jump



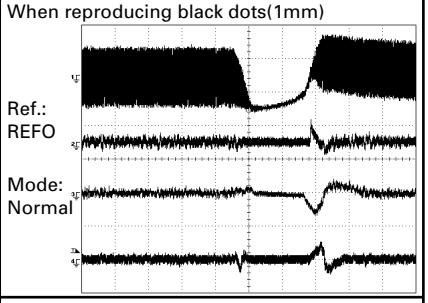
⑬ RFAGC	1V/div	5ms/div
⑩ TE	500mV/div	
⑦ TIN	500mV/div	

100(32x3) Track Jump



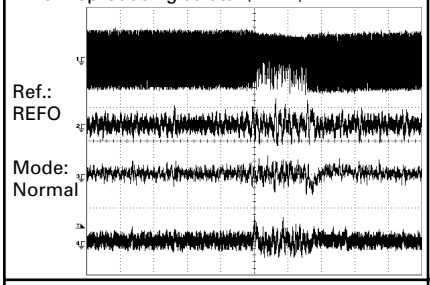
⑬ RFAGC	1V/div	500µs/div
⑦ TIN	1V/div	
⑩ TE	1V/div	
⑧ FIN	1V/div	

When reproducing black dots(1mm)



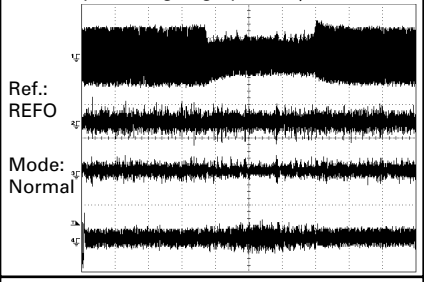
⑬ RFAGC	1V/div	500µs/div
⑩ TE	1V/div	
⑥ CIN	500mV/div	
⑤ SIN	2V/div	

When reproducing scratch(1mm)



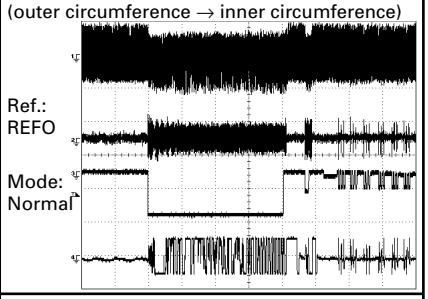
⑬ RFAGC	1V/div	5ms/div
⑩ TE	1V/div	
⑥ CIN	500mV/div	
⑤ SIN	2V/div	

When reproducing fingerprint(65µm)



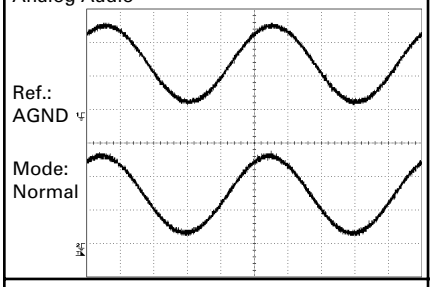
⑬ RFAGC	1V/div	500µs/div
⑩ TE	1V/div	
⑥ CIN	500mV/div	
⑤ SIN	2V/div	

During inside/outside search
(outer circumference → inner circumference)



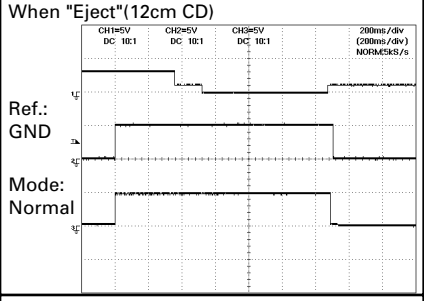
⑭ LOUT	1V/div	200µs/div
⑮ ROUT	1V/div	

Analog Audio



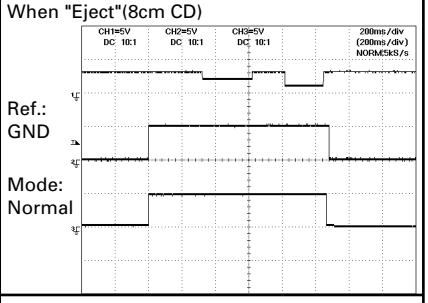
① DSCSNS	5V/div	200ms/div
② CLCONT	5V/div	
③ LOEJ	5V/div	

When "Eject"(12cm CD)



① DSCSNS	5V/div	200ms/div
② CLCONT	5V/div	
③ LOEJ	5V/div	

When "Eject"(8cm CD)



6.3 ERROR MODE

● Error Messages

If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

2) Head unit display examples

Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.

8-digit display	6-digit display	4-digit display
ERROR–xx	ERR–xx	E–xx

(2) Error Code List

Code	Class	Displayed error code	Description of the code and potential cause(s)
10	Electricity	Carriage Home NG SERVO LSI Communication Error	CRG can't be moved to inner diameter. CRG can't be moved from inner diameter. → Failure on home switch or CRG move mechanism. Communication error between microcomputer and SERVO LSI.
11	Electricity	Focus Servo NG	Focusing not available. → Stains on rear side of disc or excessive vibrations on REWRITABLE.
12	Electricity	Spindle Lock NG Subcode NG	Spindle not locked. Sub-code is strange (not readable). → Failure on spindle, stains or damages on disc, or excessive vibrations. A disc not containing CD-R data is found. Turned over disc are found, though rarely. CD signal error.
17	Electricity	Setup NG	AGC protection doesn't work. Focus can be easily lost. → Damages or stains on disc, or excessive vibrations on REWRITABLE.
30	Electricity	Search Time Out	Failed to reach target address. → CRG tracking error or damages on disc.
44	Electricity	ALL Skip	Skip setting for all track. (CD-R/RW)
50	Mechanism	CD On Mech Error	Mechanical error during CD ON. → Defective loading motor, mechanical lock and mechanical sensor.
A0	System	Power Supply NG	Power (VD) is ground faulted. → Failure on SW transistor or power supply (failure on connector).

Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).

Unreadable TOC does not constitute an error. An intended operation continues in this case.

Upper digits of an error code are subdivided as shown below:

1x: Setup relevant errors, 3x: Search relevant errors, Ax: Other errors.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

● **Removing the Case (not shown)**

1. Remove the Case.

● **Removing the CD Mechanism Module (Fig.1)**

1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.

● **Removing the Grille Assy (Fig.1)**

2 Remove the two screws and then remove the Grille Assy.

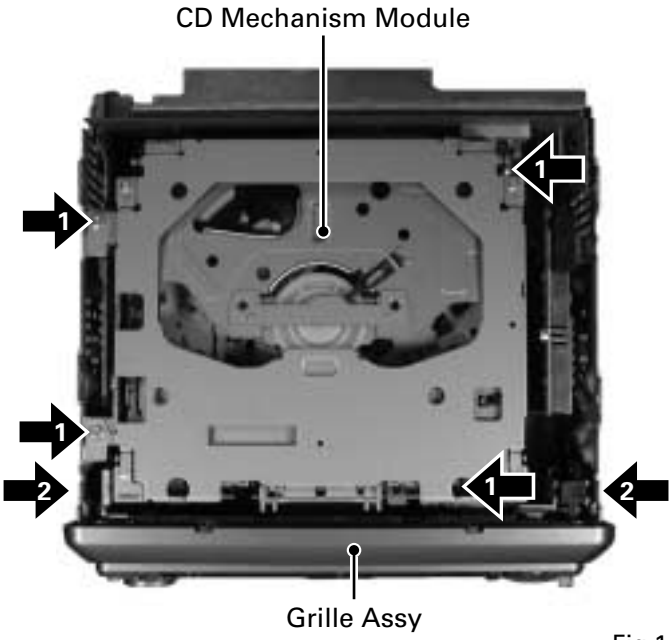


Fig.1

● **Removing the Tuner Amp Unit (Fig.2)**

1 Remove the screw.

2 Remove the three screws.

3 Straight the tabs at three locations indicated.

4 Remove the screw and then remove the Tuner Amp Unit.

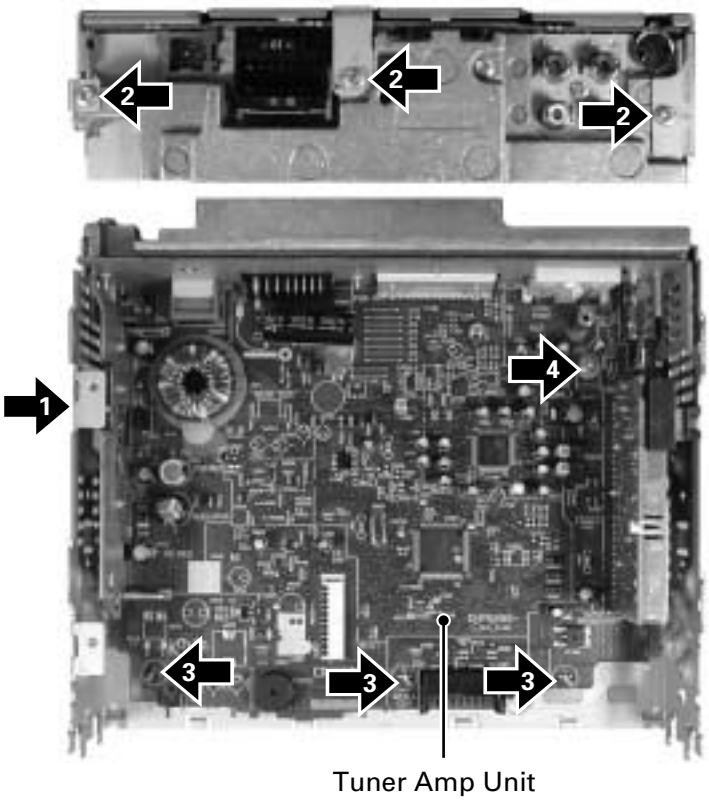
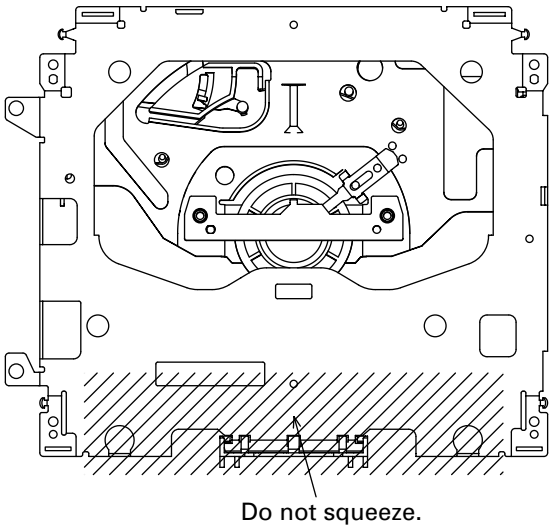


Fig.2

● How to hold the Mechanical Unit

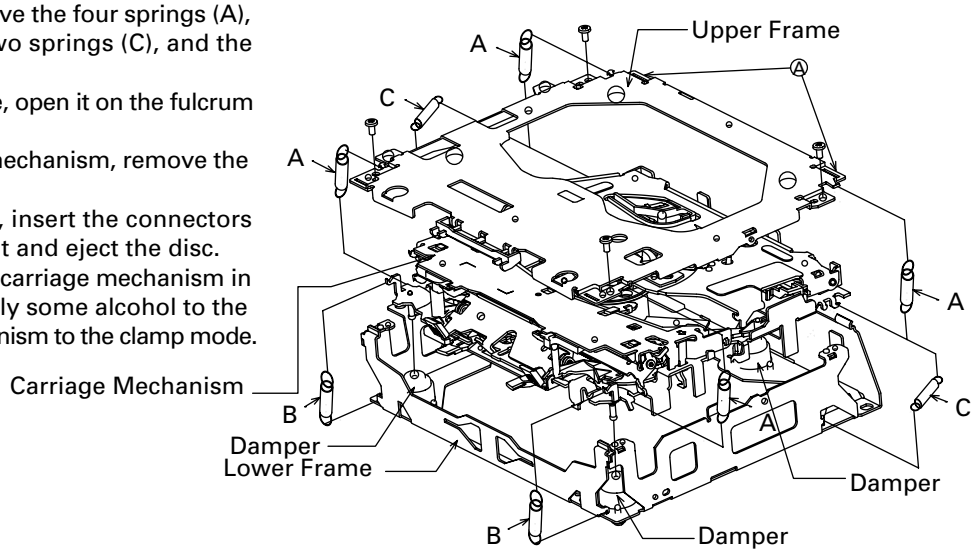
1. Hold the top and bottom frame.
2. Do not squeeze top frame's front portion too tight, because it is fragile.



● Removing the Upper and Lower Frames

1. With a disc clamped, remove the four springs (A), the two springs (B), the two springs (C), and the four screws.
2. To remove the upper frame, open it on the fulcrum A.
3. While lifting the carriage mechanism, remove the three dampers.
4. With the frames removed, insert the connectors coming from the main unit and eject the disc.

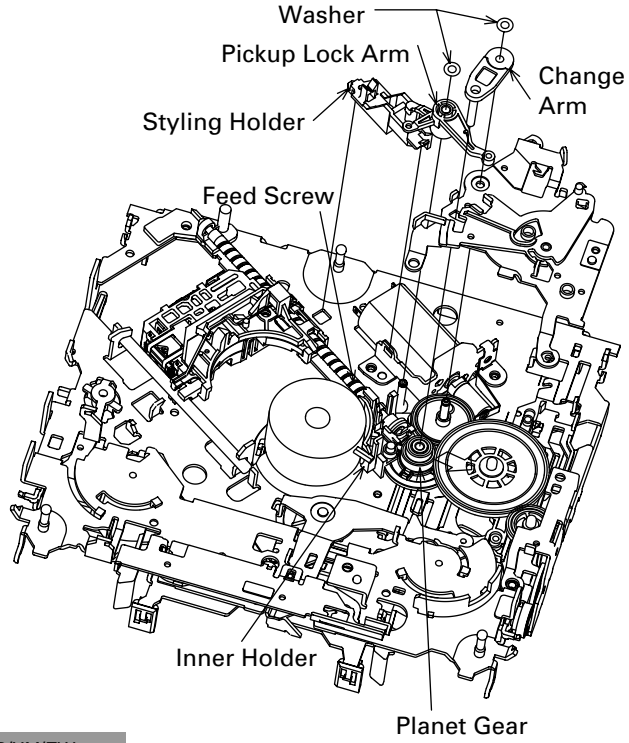
Caution: Before installing the carriage mechanism in the frames, be sure to apply some alcohol to the dampers and set the mechanism to the clamp mode.



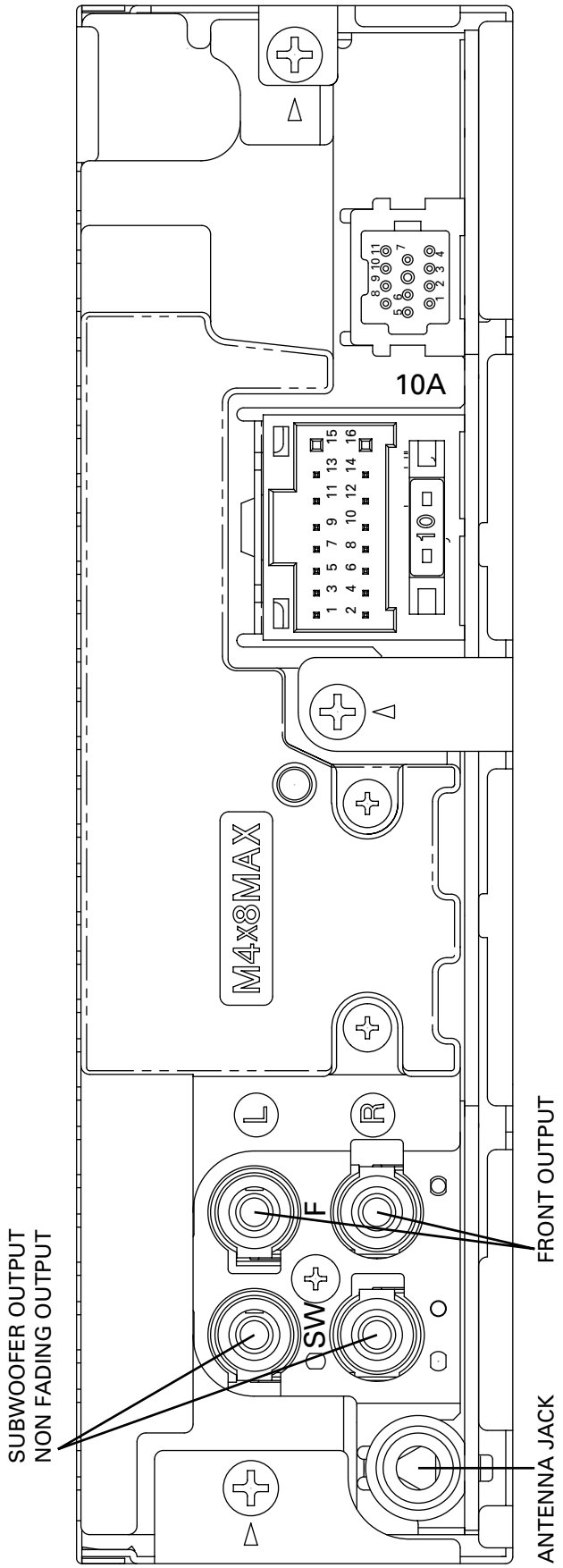
● Removing the Pickup Unit

1. Set the mechanism to the clamp mode.
2. Remove the lead wires from the inner holder.
3. Remove the two washers, styling holder, change arm, and pickup lock arm.
4. While releasing from the hook of the inner holder, lift the end of the feed screw.

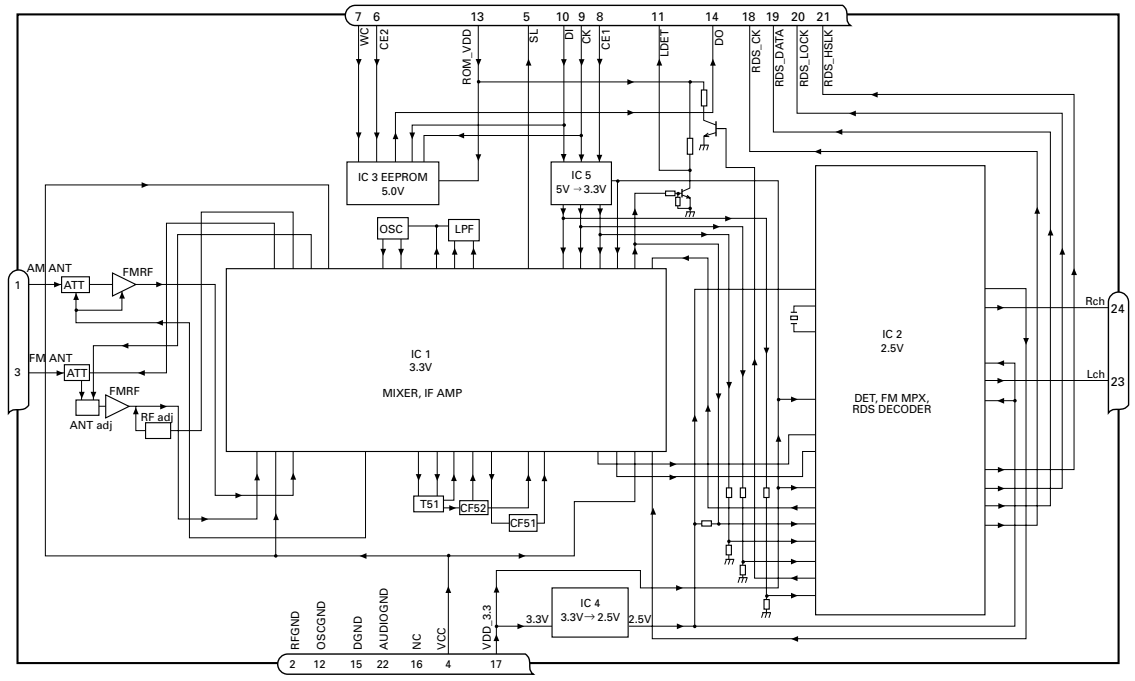
Caution: In assembling, move the planet gear to the load/eject position before setting the feed screw in the inner holder.



7.1.2 CONNECTOR FUNCTION DESCRIPTION



● FM/AM Tuner Unit



No.	Symbol	I/O	Explain	
1	AMANT	I	AM antenna input	AM antenna input high impedance AMANT pin is connected with an all antenna by way of 4.7μH. (LAU type inductor) A series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the ham of power transmission line.
2	RFGND		RF ground	Ground of antenna block
3	FMANT	I	FM antenna input	Input of FM antenna 75Ω Surge absorber(DSP-201M-S00B) is necessary.
4	VCC		power supply	The power supply for analog block. D.C 8.4V ± 0.3V
5	SL	O	signal level	Output of FM/AM signals level
6	CE2	I	chip enable-2	Chip enable for EEPROM "Low" active
7	WC	I	write control	You can write EEPROM, when EEPROM write control is "Low". Ordinary non connection
8	CE1	I	chip enable-1	Chip enable for AF•RF "High" active
9	CK	I	clock	Clock
10	DI	I	data in	Data input
11	LDET	O	lock detector	"Low" active
12	OSCGND		osc ground	Ground of oscillator block
13	ROM_VDD		power supply	Power supply for EEPROM pin 13 is connected with a power supply of micro computer.
14	DO	O	data out	Data output
15	DGND		digital ground	Ground of digital block
16	NC		non connection	Not used
17	VDD_3.3		power supply	The power supply for digital block. 3.3V ± 0.2V
18	RDS_CK	O	RDS clock	Output of RDS clock(2.5V)
19	RDS_DATA	O	RDS data	Output of RDS data(2.5V)
20	RDS_LOCK	O	RDS lock	Output unit "High" active(2.5V) (RDS_LOCK turns over by the external transistor. "Low" active)
21	RDS_HSLK	O	RDS high speed lock	Output unit "High" active(2.5V)(RDS_HSLK turns over by the external transistor. "Low" active)
22	AUDIOGND		audio ground	Ground of audio block
23	L ch	O	L channel output	FM stereo "L-ch" signal output or AM audio output
24	R ch	O	R channel output	FM stereo "R-ch" signal output or AM audio output